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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,487	11/20/2003	Juan A. Coronado	TUC920030140US1	2512

49080 7590 06/09/2008

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EXAMINER	
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ART UNIT	PAPER NUMBER
2152	

NOTIFICATION DATE	DELIVERY MODE
06/09/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/719,487	CORONADO ET AL.	
	Examiner	Art Unit	
	Richard G. Keehn	2152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/28/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-30 have been examined and are pending.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 21-30 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 21-30 fail to fall within a statutory category on invention. They are directed toward a program itself, not a process occurring as a result of executing the program, a machine programmed to operate in accordance with the program, nor a manufacture structurally and functionally interconnected with the program in a manner which enables the program to act as a computer component and realize its functionality. They are also clearly not directed to a composition of matter. Therefore they are non-statutory under 35 U.S.C. 101.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 3, 5-7, 15-17 and 25-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 3 recites the limitation "unassiging." There is insufficient antecedent basis for this limitation in the claim. Examiner assumes this to be a typographical error and will assume applicant meant “unassigning.”

6. Claims 5-6, 15-16 and 25-26 recite the limitation "PPRC.” Applicant is required to clearly specify the abbreviation.

7. Claims 7, 17 and 27 recite the limitation "XRC.” Applicant is required to clearly specify the abbreviation.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 11 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by US 2002/0078296 A1 (Nakamura et al.).

As to Claims 1, 11 and 21, Nakamura et al. anticipate a method, an article of manufacture comprising a computer useable medium having computer readable program code, and a computer program product usable with a programmable computer processor having computer readable program code embodied therein (hereby referred to as “the system”) to control access to logical volumes disposed in one or more information storage and retrieval systems using copy service relationships, comprising the steps of:

providing a first information storage and retrieval system comprising a plurality of first logical volumes (Nakamura et al. - Page 2, ¶ [0011] recites a first and second storage and retrieval system comprised of a first and second set of logical volumes respectively);

providing a second information storage and retrieval system comprising a plurality of second logical volumes (Nakamura et al. - Page 2, ¶ [0011] recites a first and second storage and retrieval system comprised of a first and second set of logical volumes respectively);

providing a plurality of host computers, wherein each of said plurality of host computers is capable of communicating with said first information storage and retrieval system (Nakamura et al. – Page 3, ¶ [0031] with Figure 1 recite the MCU's, items 102 and 103 capable of communicating with the first logical volumes, item 108, within item 102);

forming (N) host computer groups, wherein (N) is greater than or equal to 1 (Nakamura et al. - ¶ [0026-0027] with Figure 1 recite host computer groups 101 and 103);

assigning each of said plurality of host computers to the a host computer group (Nakamura et al. – Figure 1, computers 102 and 105 are assigned to group 101, similarly computers 104 and 106 are assigned to group 103);

forming (N) logical volume groups (Nakamura et al. - ¶ [0020] recites selecting ones of paired logical volumes);

assigning one or more of said plurality of first logical volumes to a logical volume group (Nakamura et al. - ¶ [0020] recites pairing off logical volumes into a logical group);

receiving a request from a host computer assigned to the (i)th host computer group to establish a copy service relationship between a source logical volume and a target logical volume, wherein (i) is greater than or equal to 1 and less than or equal to (N) (Nakamura et al. – Page 3, ¶ [0033] recites the MCU 102 the reading and writing operations of the host unit and control of copying operation from the first volumes 108 to the paired second volumes 111);

determining if said source logical volume is assigned to the (i)th logical volume group (Nakamura et al. - ¶ [0020] recites selecting ones of paired logical volumes and the recreation of the pair after one of said pair is disabled, hence the identification of a paired member is taught);

operative if said target logical volume is assigned to the (i)th logical volume group, determining if said second logical volume is assigned to the (i)th logical volume group (Nakamura et al. - ¶ [0020] recites selecting ones of paired logical volumes hence members of said pair are determined);

operative if both the source logical volume and the target logical volume are assigned to the (i)th logical volume group, establishing said copy service relationship (Nakamura et al. – Page 3, ¶ [0033] recites the MCU 102 the reading and writing operations of the host unit and control of copying operation from the first volumes 108 to the paired second volumes 111).

10. Claims 1-4, 11-14 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by non-patent literature dated March 21, 1995 entitled "HP-UX 10.0 Logical Volume Manager White Paper" (Hewlett-Packard).

As to Claims 1, 11 and 21, Hewlett-Packard anticipates a method, an article of manufacture comprising a computer useable medium having computer readable program code, and a computer program product usable with a programmable computer processor having computer readable program code embodied therein (hereby referred to as "the system") to control access to logical volumes disposed in one or more information storage and retrieval systems using copy service relationships, comprising the steps of:

providing a first information storage and retrieval system comprising a plurality of first logical volumes (Hewlett-Packard – Page 5 recites mirroring wherein separate first and second and third logical volumes are paired to create a copy of one another);

providing a second information storage and retrieval system comprising a plurality of second logical volumes (Hewlett-Packard – Page 5 recites mirroring wherein separate first and second and third logical volumes are paired to create a copy of one another);

providing a plurality of host computers, wherein each of said plurality of host computers is capable of communicating with said first information storage and retrieval

system (Hewlett-Packard – Page 5 recites the Physical Volume Group of separate computers connected via I/O channels or interface adapters);

forming (N) host computer groups, wherein (N) is greater than or equal to 1 (Hewlett-Packard – Page 5 recites the Physical Volume Group of separate computers connected via I/O channels or interface adapters);

assigning each of said plurality of host computers to the a host computer group (Hewlett-Packard – Page 5 recites the Physical Volume Group of separate computers connected via I/O channels or interface adapters);

forming (N) logical volume groups (Hewlett-Packard – Page 6 recites the Logical Volume Group);

assigning one or more of said plurality of first logical volumes to a logical volume group (Hewlett-Packard – Page 5 recites the Physical Volume Group of separate computers connected via I/O channels or interface adapters);

receiving a request from a host computer assigned to the (i)th host computer group to establish a copy service relationship between a source logical volume and a target logical volume, wherein (i) is greater than or equal to 1 and less than or equal to (N) (Hewlett-Packard – page 21 recites the “lvmerge” and “lvcreate” commands used to create mirrored logical volume relationships);

determining if said source logical volume is assigned to the (i)th logical volume group (Hewlett-Packard – page 21 recites the “lvdisplay” command used to retrieve information about logical volumes);

operative if said target logical volume is assigned to the (i)th logical volume group, determining if said second logical volume is assigned to the (i)th logical volume group (Hewlett-Packard – page 21 recites the "lvdisplay" command used to retrieve information about logical volumes including mirrored status information);

operative if both the source logical volume and the target logical volume are assigned to the (i)th logical volume group, establishing said copy service relationship (Hewlett-Packard – Page 5 recites mirroring wherein logical volumes in the same mirror grouping are placed into a copy relationship).

As to Claims 2, 12 and 22, Hewlett-Packard anticipates the system of claims 1, 11 and 21 respectively, further comprising the steps of:

receiving a request to revise access rights to one or more of said plurality of first logical volumes or one or more of said plurality of second logical volumes (Hewlett-Packard, Page 21 recites the "lvcreate" and "lvchange" commands which revise, inter alia, mirroring functions);

determining if said request comprises assigning to one of said (N) logical volume groups a logical volume in a copy relationship (Hewlett-Packard – Page 21 recites the creation of logical volumes into a copy arrangement);

operative if said request comprises assigning to one of said (N) logical volume groups a logical volume in a copy relationship, denying said request (Hewlett-Packard – Page 5 recites the Quorum requirement wherein at least 50% of the mirrored volume disks must be present to change the volume group. Page 2 recites that up to 3 volumes

can be mirrored. Hence if a request to change 1 of 3 mirrored volumes is presented, the quorum requirement will not be met and the request will be denied).

As to Claims 3, 13 and 23, Hewlett-Packard anticipates the system of claims 1, 11 and 21 respectively, further comprising the steps of:

receiving a request to revise access rights to one or more of said plurality of first logical volumes (Hewlett-Packard, Page 21 recites the "lvsplit" command which unassigns the volumes from a mirrored relationship);

determining if said request comprises unassigning one of said first logical volumes in a copy relationship (Hewlett-Packard, Page 21 recites the "lvsplit" command which unassigns the volumes from a mirrored relationship);

operative if said request comprises unassigning one of said first logical volumes in a copy service relationship, wherein said copy service relationship comprises a copy session, determining whether to complete said copy session and then terminate the copy service relationship (Hewlett-Packard – Page 5 recites the Quorum requirement wherein at least 50% of the mirrored volume disks must be present to change the volume group);

operative if said request comprises unassigning one of said first logical volumes in a copy service relationship and if said copy session is to be completed prior to terminating said copy service relationship (Hewlett-Packard - Page 20 recites the synchronous mode. If running in this mode, the file system activity must complete before the process is allowed to continue. Therefore, if running in synchronous mode

and an lvsplit command is issued, copy in progress would complete before terminating the mirror relationship and unassigning the mirrored volumes from their mirrored relationship):

completing said copy session (Hewlett-Packard - Page 20 recites the synchronous mode. If running in this mode, the file system activity must complete before the process is allowed to continue. Therefore, if running in synchronous mode and an lvsplit command is issued, copy in progress would complete before terminating the mirror relationship and unassigning the mirrored volumes from their mirrored relationship);

terminating said copy service relationship (Hewlett-Packard - Page 20 recites the synchronous mode. If running in this mode, the file system activity must complete before the process is allowed to continue. Therefore, if running in synchronous mode and an lvsplit command is issued, copy in progress would complete before terminating the mirror relationship and unassigning the mirrored volumes from their mirrored relationship); and

unassiging said one of said first logical volumes (Hewlett-Packard - Page 20 recites the synchronous mode. If running in this mode, the file system activity must complete before the process is allowed to continue. Therefore, if running in synchronous mode and an lvsplit command is issued, copy in progress would complete before terminating the mirror relationship and unassigning the mirrored volumes from their mirrored relationship).

As to Claims 4, 14 and 24, Hewlett-Packard anticipates the system of claims 3, 13 and 23 respectively, further comprising the steps of:

operative if said request comprises unassigning one of said first logical volumes but does not comprise un assigning one of said first logical volumes in a copy service relationship, unassigning said one of said first logical volumes (Hewlett-Packard – Page 17 recites the "vgexport" command which unassigns a logical volume. This works on volumes whether mirrored or not);

operative if said request comprises unassigning one of said first logical volumes in a copy service relationship and if said copy service relationship is not to be terminated denying the request to unassign said one of said first logical volumes (Hewlett-Packard – Page 5 recites the Quorum requirement wherein at least 50% of the mirrored volume disks must be present to change the volume group);

operative if said copy session will not be completed prior to terminating said copy service relationship:

terminating said copy service relationship prior to completing said copy session (Hewlett-Packard – Page 18 recites the system crash recovery wherein a volume fails, the mirroring is disabled and data is backed up on one of the previously mirrored volumes. Reassignment of the mirrored relationship occurs after the physical problem has been resolved); and

unassigning said one of said first logical volumes (Hewlett-Packard – Page 18 recites the system crash recovery wherein a volume fails, the mirroring is disabled and

data is backed up on one of the previously mirrored volumes. Reassignment of the mirrored relationship occurs after the physical problem has been resolved).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103." See *KSR Intern. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742 (2007).

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 5-7, 15-17 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hewlett-Packard as applied to claims 1, 11 and 21 above, and further in view of US 6,145,066 (Atkin).

As to Claims 5, 15 and 25, Hewlett-Packard discloses an invention substantially as claimed, including the system of claims 1, 11 and 21 respectively, further comprising the steps of:

providing a configuration interface interconnected to said first information storage and retrieval system (Hewlett-Packard – Page 21 recites the System management commands to perform LVM configuration operations);

operative if said copy service relationship comprises a [*mirroring*] relationship, determining if said request was provided by said configuration interface (Hewlett-Packard – Page 21 recites the “lvcreate” instruction which can be used to create a copy

relationship. If the command is given, it executes the copy relationship. If the command is not given, no relationship is made at that time);

operative if said copy service relationship comprises a [mirroring] relationship, determining if said request was provided by said configuration interface (Hewlett-Packard – Page 21 recites the "lvcreate" instruction which can be used to create a copy relationship. If the command is given, it is determined to have been received by the configuration interface, and it executes the copy relationship. If the command is not given, no relationship is made at that time);

operative if said request was provided by said configuration interface (Hewlett-Packard – Page 21 recites the "lvcreate" instruction which can be used to create a copy relationship. If the command is given, it is determined to have been received by the configuration interface, and it executes the copy relationship. If the command is not given, no relationship is made at that time),

establishing the [*mirroring*] relationship (Hewlett-Packard – Page 21 recites the "lvcreate" instruction which can be used to create a copy relationship. If the command is given, it is determined to have been received by the configuration interface, and it executes the copy relationship. If the command is not given, no relationship is made at that time);

operative if said request was not provided by said configuration interface, not establishing the requested [*mirroring*] relationship (Hewlett-Packard – Page 21 recites the "lvcreate" instruction which can be used to create a copy relationship. If the command is given, it is determined to have been received by the configuration interface,

and it executes the copy relationship. If the command is not given, no relationship is made at that time).

Hewlett-Packard does not disclose, but Atkin discloses an invention substantially as claimed, including determining if said copy service relationship comprises a PPRC relationship (Atkin - Column 3, lines 47-64 recite the use of the Peer-to-Peer Remote Copy feature); and the PPRC relationship (Atkin - Column 3, lines 47-64 recite the use of the Peer-to-Peer Remote Copy feature).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine PPRC taught by Atkin, with the mirroring relationship taught by Hewlett-Packard.

One of ordinary skill in the art at the time the invention was made would have been motivated to add migration facility to the copy feature (Atkin – Column 4, lines 4-11).

As to Claims 6, 16 and 26, the combination of Hewlett-Packard and Atkin discloses an invention substantially as claimed, including the system of claims 5, 15 and 25 respectively, further comprising the steps of:

receiving a termination request to terminate said [*mirroring*] relationship (Hewlett-Packard – Page 21 recites the “lvsplit” command which terminates the mirroring relationship);

determining if said termination request was provided by said configuration interface (Hewlett-Packard – Page 21 recites the “lvsplit” instruction which can be used

to terminate a copy relationship. If the command is given, it executes the termination of a copy relationship. If the command is not given, no relationship termination is made at that time);

operative if said termination request was provided by said configuration interface, terminating the [*mirroring*] relationship (Hewlett-Packard – Page 21 recites the "lvsplit" instruction which can be used to terminate a copy relationship. If the command is given, it executes the termination of a copy relationship. If the command is not given, no relationship termination is made at that time);

operative if said termination request was not provided by said configuration interface, denying the request to terminate the [*mirroring*] relationship (Hewlett-Packard – Page 21 recites the "lvsplit" instruction which can be used to terminate a copy relationship. If the command is given, it executes the termination of a copy relationship. If the command is not given, no relationship termination is made at that time).

Hewlett-Packard does not disclose, but Atkin discloses an invention substantially as claimed, including PPRC relationship (Atkin - Column 3, lines 47-64 recite the use of the Peer-to-Peer Remote Copy feature).

The motivation and obviousness arguments are the same as in Claim 5.

As to Claims 7, 17 and 27, Hewlett-Packard discloses an invention substantially as claimed, including the system of claims 1, 11 and 21.

Hewlett-Packard does not disclose, but Atkin discloses an invention substantially as claimed, including further comprising the steps of:

determining if said requested copy service relationship comprises an XRC relationship (Atkin - Column 3, lines 7-21 recite the use of XRC);

operative if said requested copy service relationship comprises an XRC relationship, denying said request to establish said XRC relationship (Atkin – Column 3, lines 45-61 recite the choice of PPRC over XRC).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the exclusion of XRC taught by Atkin, with the mirroring relationship taught by Hewlett-Packard.

One of ordinary skill in the art at the time the invention was made would have been motivated to avoid using a copy scheme that is complex to use and operationally expensive and resource intensive (Atkin – Column 3, lines 45-46).

16. Claims 8, 18 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hewlett-Packard as applied to claims 1, 11 and 21 above, and further in view of US 2002/0069369 A1 (Tremain).

As to Claims 8, 18 and 28, Hewlett-Packard discloses an invention substantially as claimed, including the system of claims 1, 11 and 21 respectively, further comprising the steps of:

providing a configuration interface interconnected with said first information storage and retrieval system (Hewlett-Packard – Page21 recites the System management commands to perform LVM configuration operations);

operative if said copy service relationship comprises a [*mirroring*] relationship, determining if said request was provided by said configuration interface (Hewlett-Packard – Page 21 recites the "lvcreate" instruction which can be used to create a copy relationship. If the command is given, it executes the copy relationship. If the command is not given, no relationship is made at that time);

operative if said request was provided by said configuration interface, establishing the requested [*mirroring*] relationship (Hewlett-Packard – Page 21 recites the "lvcreate" instruction which can be used to create a copy relationship. If the command is given, it is determined to have been received by the configuration interface, and it executes the copy relationship. If the command is not given, no relationship is made at that time);

operative if said request was not provided by said configuration interface, denying the request to establish a [*mirroring*] relationship (Hewlett-Packard – Page 21 recites the "lvcreate" instruction which can be used to create a copy relationship. If the command is given, it is determined to have been received by the configuration interface, and it executes the copy relationship. If the command is not given, no relationship is made at that time).

Hewlett-Packard does not disclose, but Tremain discloses an invention substantially as claimed, including determining if said copy service relationship

comprises a remote FlashCopy relationship (Tremain - ¶ [0187] recites the use of Flashcopy facilities); and the remote FlashCopy relationship (Tremain - ¶ [0187] recites the use of Flashcopy facilities).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Flashcopy taught by Tremain, with the mirroring relationship taught by Hewlett-Packard.

One of ordinary skill in the art at the time the invention was made would have been motivated to provide customers with available virtual machine environments (Tremain - ¶ [0187]).

17. Claims 9-10, 19-20 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hewlett-Packard as applied to claims 1, 11 and 21 above, and further in view of US 6,735,636 B1 (Mokryn et al.).

As to Claims 9, 19 and 29, Hewlett-Packard discloses an invention substantially as claimed, including the system of claims 1, 11 and 21 respectively, further comprising the steps of:

determining if said requested copy service relationship comprises adding a new source logical volume and/or a new target logical volume to an existing [*mirroring*] session comprising an existing logical volume group (Hewlett-Packard – Page 21 recites the "lvextend" command which adds physical extents allocated to a logical

volume, hence the logical size changes as well. If the command is given, the volume is extended. If the command is not given, then volume is not extended);

operative if said requested copy service relationship comprises adding a new source logical volume or a new target logical volume to an existing [*mirroring*] session, determining if said new source logical volume and/or said new target logical volume are assigned to said existing logical volume group (Hewlett-Packard – Page 21 recites the "lvextend" command targeted to a specific volume. The Logical Volume Manager (Page 5) knows whether the volume belongs to a volume group);

operative if said new source logical volume and/or said new target logical volume are assigned to said existing logical volume group, adding said new source logical volume and/or said new target logical volume to said existing [*mirroring*] session (Hewlett-Packard – Page 21 recites the "lvextend" command which adds physical extents allocated to a logical volume, hence the logical size changes as well. If the command is given, the volume is extended. If the command is not given, then volume is not extended).

Hewlett-Packard does not disclose, but Mokryn et al. disclose an invention substantially as claimed, including Concurrent Copy relationship (Mokryn et al. – Column 2, lines 41-49 recite using Concurrent Copy for mirroring).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Concurrent Copy taught by Mokryn et al., with the mirroring copy system taught by Hewlett-Packard.

One of ordinary skill in the art at the time the invention was made would have been motivated to apply commercially available mirroring methods (Mokryn et al. – Column 2, lines 41-49).

As to Claims 10, 20 and 30, the combination of Hewlett-Packard and Mokryn et al. disclose an invention substantially as claimed, including the system of claims 9, 19 and 29 respectively, further comprising the step of:

operative if said new source logical volume and/or said new target logical volume are not assigned to said existing logical volume group, not adding said new source logical volume and/or said new target logical volume to said existing [*mirroring*] session (Hewlett-Packard – Page 21 recites the "lvextend" command which adds physical extents allocated to a logical volume, hence the logical size changes as well. If the command is given, the volume is extended. If the command is not given, then volume is not extended).

Hewlett-Packard does not disclose, but Mokryn et al. discloses an invention substantially as claimed, including Concurrent Copy relationship (Mokryn et al. – Column 2, lines 41-49 recite using Concurrent Copy for mirroring).

The motivation and obviousness arguments are the same as in Claim 9.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These include:

- US 2003/0120699 A1 - Variable synchronicity between duplicate transactions.
- US 6,351,792 B1 - Selective remote storage copy system and methods.
- US 6,131,148 A - Snapshot copy of a secondary volume of a PPRC pair.
- US 5,920,695 A - Method and means for bidirectional peer-coupled communication across a single ESCON interface.
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard G. Keehn whose telephone number is 571-270-5007. The examiner can normally be reached on Monday through Thursday, 8:30am - 7:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571-272-3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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RGK

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